

## **MULTI-VOLTAGE ADAPTOR**

### **Field of the invention**

The present invention relates to a multi-voltage adaptor and, more particularly, to a device, which can change a different positioning component to  
5 obtain a corresponding voltage output.

### **Background of the invention**

An adaptor is a power supply device used in many electric appliances or electronic equipments. For instance, an adaptor is provided in an audio, an electric charger, a printer and a notebook computer to convert the home AC  
10 power into a DC power output of an appropriate value (e.g., DC 5V, DC 9V, DC 12V or DC 16V) for operation of the electric appliance or electronic equipment.

As shown in Fig. 1, a conventional adaptor comprises a power supply shell body 11a, a wire 12a, a DC plug 13a and a public electric plug 14a. The power  
15 supply shell body 11a is used to convert an AC power inputted from the public electric plug 14a into a DC power by using an internal conversion circuit thereof (not shown). The DC plug 13a is used to output the DC power to an electric appliance or electronic equipment. When plugged into a notebook computer, the adaptor can also be used as an electric charger.

20 However, the DC plug 13a of the adaptor of this kind has only a voltage output, and cannot provide a different voltage for a different electric appliance or electronic equipment. An adjustable adaptor has thus been developed.

As shown in Fig. 2, in an adjustable adaptor, a knob (or a DIP switch) 15a is added on the power supply shell body 11a to match a conversion circuit (not  
25 shown) in the power supply shell body 11a so that a user can turn the knob 15a

to a DC voltage to be outputted for electric appliances or electronic equipments of different specifications.

However, there still exist some problems. It is necessary to first solder the conversion circuit in the adaptor, resulting in inconvenient assembly and a high cost. Moreover, the knob 15a is generally of three-stage or five-stage design. The flexibility of selection is thus low. Furthermore, erroneous adjustment may easily arise in practice because of too easy adjustment. Besides, the knob 15a may loosen to cause erroneous adjustment of user after many times of use.

As shown in Fig. 3, the adaptor can also be used in a car with the public electric plug 14a replaced by a car power adapting head 14a'. After plugged into the car lighter socket, the adaptor can be used in the car. It is also necessary to solder the conversion circuit (not shown) in the car power adapting head 14a', resulting in trouble in manufacturing and a high cost. Moreover, the flexibility of selection is much limited.

Accordingly, the above adaptor has inconvenience and drawbacks in practical use. The present invention aims to resolve the problems in the prior art.

### **Summary of the invention**

One object of the present invention is to provide a multi-voltage adaptor, whose voltage output is changed through an external positioning component. Because the positioning component has convenience in selection and a low cost, and can be easily manufactured and conveniently replaced, a high use efficiency in economy can be accomplished.

Another object of the present invention is to provide a voltage adaptor applicable to both the public electric power and the car power, wherein several

sets of DC voltage outputs are designed in a conversion circuit in a voltage adapting body. Therefore, it is only necessary to select a different positioning pole to obtain a corresponding voltage output for a different electric appliance or electronic equipment.

- 5 To achieve the above objects, in the present invention, a positioning base having multiple hole positions is concavely disposed on a voltage adapting body to connect a positioning component. Two positioning poles capable of connecting a hole position of the positioning base are disposed on the positioning component. A different voltage output can be selected through a  
10 different position of the positioning poles.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing, in which:

**Brief description of the drawings:**

- 15 Fig. 1 is a perspective view of a conventional adaptor;  
Fig. 2 is a perspective view of a conventional adjustable adaptor with a public electric plug attached thereon;  
Fig. 3 is a perspective view of a conventional adjustable adaptor with a car power adapting head attached thereon;  
20 Fig. 4 is a use state diagram of the present invention before assembly;  
Fig. 5 is an assembly view of the present invention;  
Fig. 6 is a diagram of a positioning component of the present invention;  
Fig. 7 is another diagram of the positioning component of the present invention;  
25 Fig. 8 is yet another diagram of the positioning component of the present

invention;

Fig. 9 is a perspective view of another embodiment of the present invention;

Fig. 10 is a perspective view of yet another embodiment of the present invention; and

5 Fig. 11 is a use state diagram of still yet another embodiment of the present invention before assembly.

### **Detailed description of the preferred embodiments**

As shown in Figs. 4 and 5, the present invention provides a multi-voltage adaptor comprising a voltage adapting body 1 and a positioning component 2.

10 The voltage adapting body 1 has a power supply shell body 11 therein. A conversion circuit (not shown) is disposed in the power supply shell body 11. The conversion circuit is connected a public electric plug 14 and a DC plug 13a via a wire 12. The public electric plug 14 provides an AC power input to the conversion circuit, which converts the input AC power into a DC power output  
15 sent to the DC plug 13a for providing the working electricity for an electric appliance or electronic equipment. A positioning base 15 having multiple holes 16 are concavely disposed on the power supply shell body 11. In this embodiment, the positioning base 15 is slightly pentagonal and has five holes.

Two positioning poles 21 capable of connecting the holes 16 of the  
20 positioning base 15 are disposed on the positioning component 2. Because the conversion circuit in the voltage adapting body 1 has been designed to have several sets of DC output voltages, it is only necessary to select the positioning poles 21 to achieve electric connection with the conversion circuit for generating a corresponding voltage output.

25 When a user connects the two positioning poles 21 of the positioning

component 2 to a corresponding hole 16 of the voltage adapting body 1, the conversion circuit in the voltage adapting body 1 will generate a corresponding voltage output.

As shown in Figs. 6 to 8, if a different positioning component 2 has been replaced, the voltage adapting body 1 will obtain a different voltage output. This embodiment has positioning components capable of outputting a DC voltage of 16V, 19V or 20V for selective use by an electric appliance or electronic equipment. The space arrangement of the positioning poles 21 has been designed in advance.

Therefore, the problems of inconvenient assembly, high cost and so on of the conventional adjustable adaptor can be effectively solved. The use risk of user can also be reduced. For convenient discrimination, a different voltage value can be directly printed on each positioning component 2 during manufacturing.

As shown in Fig. 9, the public electric plug can be replaced with a car power adapting head 14'. After plugged into a car lighter socket, the adaptor can be used in the car. A user can thus match a different positioning component with the voltage adapting body 1 to use a notebook computer, a video CD player, a PDA or a mobile communication equipment in the car.

Fig. 10 shows a connection way between the positioning base 15 and the positioning component 2, wherein the positioning base 15 is female and the positioning component 2 is male. An electric insertion slot 17 is disposed on the positioning base 15 of the voltage adapting body 1 to be connected with the positioning component 2' having a connector thereon. Because the conversion circuit in the voltage adapting body 1 has been designed to have several sets of DC output voltages, it is only necessary to connect the positioning component

2' with the insertion slot 17 of the positioning base 15 to achieve electric connection with the conversion circuit for generating a corresponding voltage output.

As shown in Fig. 11, a positioning base 15' having four sets of holes is concavely disposed on the voltage adapting body 1. The positioning base 15' is rectangular.

When a user connects the two positioning poles 21' of the positioning component 2 with the corresponding holes 16' of the voltage adapting body 1, the conversion circuit in the voltage adapting body 1 will generate a corresponding voltage output like a DC voltage of 15V, 16V, 19V or 20V.

Besides, the positioning base 15 or 15' can be a female or male one, and can be of any shape or designed with a circuit board to accomplish the object of electric connection.

Although the present invention has been described with reference to the preferred embodiment thereof, it will be understood that the invention is not limited to the details thereof. Various substitutions and modifications have been suggested in the foregoing description, and other will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.